RIVERS AND FLOODS, JANUARY, 1912.

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Floods occurred during the month in many of the rivers of the South Atlantic and East Gulf States due to excessive precipitation that overspread those sections on January 8 and 9, coming at a time when the rivers were already comparatively high. Had the floods occurred during the growing season of the year, the damage caused by them would have been much greater, as a large acreage of agricultural land was inundated.

The tributaries of the Pedee River System of South Carolina were considerably above the normal stage at the beginning of the month as a result of the December rains, and when the heavy precipitation of January 8–9 contributed to them, it was evident that flood stages would be reached in the Black River and Lynch Creek within a few days. Warnings were issued accordingly and were fully verified, the crest at Effingham, S. C., on Lynch Creek being 1 foot above the flood stage on January 11, and the crest at Kingstree, S. C., on the Black River within 0.2 foot of the flood stage on January 12–13. The subsequent fall in Lynch Creek was very slow, the stage at Effingham, S. C., on January 18 being only 1 foot below flood stage. A warning was issued on January 11 for flood stages in the lower Pedee River about the 16th, but the rise was checked by an unusually severe freeze in that locality, and the crest was not as high as anticipated, being 1.7 feet below the flood stage on January 14–16. High water also occurred in the Wateree River and warnings of the coming of the same were issued on January 8. Flood stages were not reached, but as certain interests are affected when the river is several feet below that stage, the warnings were justified. No damage of consequence resulted from the high waters, and the value of property saved through the use of the warnings along the Pedee System probably amounted to about $1,000.

A flood was experienced in the Flint River and high water in the lower reaches of the Chattahoochee River, tributaries of the Apalachicola. The excessive rainfall of January 8–9 was the cause of the Flint River, already above normal stage, rising rapidly to a few feet above the flood stage, 24.4 feet being recorded at Albany, Ga., and 26.0 feet at Bainbridge, Ga. Warnings of the sudden rise were issued on January 9, and no damage of consequence resulted from the flood except at Albany, Ga., where a local power company suffered to the extent of about $1,000.

The Ocmulgee River of Georgia was also in flood, especially the lower reaches, where stages in excess of the flood stage occurred as a result of conditions similar to those which caused the flood in the Flint River. The losses were inconsequential.

High water prevailed in the Tombigbee River during the latter part of December, 1911, and the first week of January, 1912. Timely warnings were issued, and although flood stages were exceeded at several places, the excess at Demopolis, Ala., being 13.5 feet on January 5–6, the damage was comparatively small. The intensity of the flood was diminished to a great extent by the moderate stages that prevailed in the Alabama River, thereby allowing the waters to run out more rapidly than would have been the case had the Alabama also been in flood. The warnings were of great benefit to lumber interests along the lower Tombigbee, as preparation was made for the movement of a large number of logs, and the protection of property in the vicinity of Demopolis.

High water was general in the rivers of the Mobile system at the close of the month.

The Pearl River was in flood during the last week of December, 1911, and continued rains during the early part of January, 1912, kept the river above flood stage at Pearl River, La., until after January 21. Flood stage was slightly exceeded at Jackson, Miss., for the first 10 days of January, but no damage was reported. Warnings of the approaching high water were issued in ample time, and with the exception of a loss of $5,000 at a lumber company's mill in the swamps of Honey Island, and about $500 worth of stock belonging to other parties, who did not heed the warnings, the damage was comparatively small, considering the extended period of the flood.

Continued and excessive rains in the upper Yazoo delta caused that portion of the Yazoo River to rise to a few feet above the flood stage at Swan Lake, Miss., on January 5–6, and losses and damage to the extent of about $8,500 were sustained. Property to the value of about $2,000 was saved through the use of the Weather Bureau warnings. The flood was confined to the upper portion of the river.

Heavy rains during the last week of December, 1911, caused the lower Tennessee River to go above the flood stage and remain in flood during the first few days of January, 1912. The following were the crest stages reached at various points: Florence, Ala., 18.4 feet, on December 31, 1911; Riverton, Ala., 38.0 feet, on January 1, 1912; Savannah, Tenn., 37.2 feet, on January 1, 1912; Johnsonville, Tenn., 31.0 feet, on January 3, 1912. Warnings were issued in time to be of material benefit to all interests concerned, and very little damage was reported, the saving as a result of giving heed to the warnings being greatly in excess of the losses occasioned by the flood.

Floods in the Wabash River and its tributaries were due to ice gorges. The prolonged period of cold weather the first part of the month had resulted in the accumulation of a large amount of ice in the rivers, and the moderate rains about the 18th of the month over that section caused a rise and a general breaking up of the ice. Perhaps the worst gorge in the river occurred at Mount Carmel, Ill., where the ice held for several days, forming a dam that caused the river to rise to about 2 feet above the flood stage on January 27. The gorge broke during the night of January 26–27, and the river fell slowly until the end of the month, although the ice was still holding above Mount Carmel at that time. Numerous other gorges formed in the Wabash, a notable one at Attica, Ind., where the stage was forced to 6 feet above the flood

stage on January 21. This gorge did not break, the ice simply settling as the water slowly escaped. Warnings were issued as early as January 21 for precautions to be taken at Mount Carmel, Ill., and, considering the high stages that were reached at many points along the river, the damages was comparatively light.

A freshet occurred in the Willamette River of Oregon about the middle of the month. The crest stage at Portland, Oreg., being 17.3 feet, 2.3 feet above the flood stage on January 16. As the Columbia River was at a low stage the water ran out quickly, and no losses occurred.

The Sacramento River of California was lower during the month of January than it has been at this season for a number of years, and river men are experiencing grave concern over the prospects of the river running dry next summer on account of scarcity of snow in the mountains.

ICE.

Owing to the persistent low temperatures during the month the amount of ice in the rivers steadily increased. The Connecticut River at Hartford, Conn., and the Hudson at Albany, N. Y., were covered with 13 inches of ice at the end of the month, whereas there was none at the end of December. Similar conditions prevailed in the Susquehanna and Delaware Rivers. At Washington, D. C., the ice in the Potomac was 10 inches in thickness, while at the end of the preceding month there was none. The Mississippi River was frozen over almost as far as the mouth of the Ohio River, although open at St. Louis, and at all points above the mouth of the Missouri River the thickness of the ice ranged from 10 to 20 inches, while at the end of December there was none below the mouth of the Wisconsin River. There were numerous gorges formed in the Ohio River, and several broke on the 19th and 20th, doing much damage. The Missouri River was frozen throughout its entire length, with a maximum thickness of 34 inches at Bismarck, N. Dak., an increase of 15.5 inches during the month. At Kansas City, Mo., the ice was 18 inches in thickness at the end of the month, all new ice.

MOUNTAIN SNOWFALL.

South Dakota.—Reports indicate a sufficient supply of water under favorable temperature conditions.

Montana.—Chinook conditions with frozen ground caused a large runoff in the foothills and valleys, but at high altitudes there was but little runoff, daylight thawing serving to solidify the snow. As a whole the snow is in excellent condition, with prospects of a normal water supply, except in a few basins.

Wyoming.—The snow, as a rule, is well packed, but rather deficient in amount.

Colorado.—The snowfall was deficient, but well packed, and much of it is frozen.

New Mexico, Utah, and Nevada.—The month was dry, and without more snows in good quantity during the remainder of the winter, the supply of water will be low.

Idaho.—The snowfall was somewhat in excess of the usual amount, although much of it disappeared during the month, and present conditions indicate a fair water supply, except in a few localities, where a deficiency is likely.

Washington.—In the Cascades the amount of snow was generally less than the average, while in the northeastern sections it was greater.

Oregon.—While the amount of accumulated snow is rather less than usual, much of it has become solidified by rain, and there are prospects of a normal water supply.

California.—The snow supply was less than for any other month of January of which there is record, and prospects of a good water supply are very unfavorable. This is in marked contrast to the month of January, 1911, which was one of unusually heavy precipitation over the entire State.

Hydrographs for typical points on several principal rivers are shown on chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.